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BROILER GROWING

in New York State

Robert C. Baker

Foreword

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Production in New York State is small compared with that in other States; partly because New York can raise a great variety of agricultural crops, egg production for market has been most profitable, retailing is profitable but keeps numbers small, and there have been few poultry dressing plants in the State.

New York has excellent markets for broilers. Feed costs are less than in most States, and the climate assures year-round production.

Cost of Producing Broilers 7

By far the largest cost in producing broilers is feed, which accounts for approximately 70 per cent of the total. Chicks account for 15 per cent, and labor for 5 per cent. All other costs including fuel, building, equipment, medicine, interest on investment, and the like account for the remaining 10 per cent.

Business Management 9

Size of Operation. Those persons who grow broilers as a full-time job should grow no fewer than from 30,000 to 40,000 birds each year unless they dress them and carry on more of the marketing job. Many growers raise broilers as a sideline to other enterprises.

Production Practices. It is best to follow the "all-in–all-out" system which consists of filling the houses to capacity at one time and selling all the broilers at once when they are ready for market. Starting chicks each week is a disease hazard.

When to Start Broilers. The price of broilers is affected by the number started from 10 to 12 weeks prior to date of sale. One should have access to broiler placement reports.

Labor Efficiency. Automatic feeders, automatic waterers, elevators, large pens, and the like save both time and travel and reduce the cost of producing broilers. Their use may also be one reason why help stays on the farm.

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men use central heating systems, with hot water pipes, space heaters, or hot air to carry the heat. Battery brooders are sometimes used where space is limited.

Management of the Flock 28

Feeding. To be successful in the broiler business, one must get the most broiler weight in the shortest time. Increased energy value, vitamins, and antibiotics in broiler rations contribute to rapid and efficient growth.

Feeder Space. Broilers need ample feeding space, for at least half of them should be able to eat at one time.

Watering. Clean, fresh water must always be available, for chicks are not likely to hunt for water and may die from dehydration.

Floor Space. It is best not to crowd broilers but to allow 1 square foot for each broiler.

Litter. A good litter must wear well, take on moisture and give it off, be free of dust and molds, and not be too expensive. Many good litter materials are on the market.

Lights. Most growers use a low-wattage bulb to keep the birds from crowding at night. During the summer months some light helps the broilers to find feed at night when it is cool.

Cleaning the House. The pen should be cleaned thoroughly with a good disinfectant when the flock is taken out and before another is put in.

Cannibalism. One cause of cannibalism is over-crowding. The darker the house the better, but the birds need enough light to eat.

Range or Confinement. Birds on range do not grow so fast as in confinement.

Disease 31

Bronchitis, Newcastle, and "chronic respiratory" disease are the most common troubles. New York is fortunate to have five State pathologists as well as local veterinarians who diagnose or recommend treatment for poultry diseases.

Hormonized Broilers 34

Hormones cause the deposit of more fat and increase maturity and finish. Hormonized birds bring a premium of from 2 to 10 cents a pound on the market.

Marketing 34

The grower who does a good job of marketing is the most successful one. Broiler growing is only half the job; marketing is the other.

Few broilers are sold alive on the various city markets in upstate New York, but that method of marketing is popular in New York City. Many dealers buy broilers at the farm and resell them to wholesalers or dressing-plant operators. There are at present several small auctions in the State.

Selling ready-to-cook broilers has been profitable for growers who have a small dressing plant on their farm.

To build a sound, lasting business, the grower must supply a quality product that is as attractive as, if not more appealing than, other meats.

A Final Word 36

To stay in the broiler business, one must keep pace with the new and ever-changing industry. The capable, conscientious, willing-to-work and willing-to-learn person should find broiler raising a fairly profitable and pleasant business.

Broiler Growing in New York State

By ROBERT C. BAKER

History of The Broiler Business

ONLY recently has poultry been raised commercially for meat purposes. People have eaten chicken for centuries, but chicken as food was a by-product of the production of fighting birds, exhibition stock, or of egg production. In 1952, however, commercial broiler[1] production accounted for one-half of all chickens sold on a poundage basis.

The growth of the commercial broiler-production industry, a development of this century, has been rapid since 1935. From 1935 to 1939 the average annual production of broilers in the United States was 70 million. In 1948 it was 355 million, or an increase of 400 per cent over the 1935–1939 period. In 1949 broiler production jumped to about 500 million; in 1950 the production was 616 million; and in 1952 the figure grew to an unbelievable 870 million. How large the broiler business will become in the future is anyone's guess. The industry is still growing, but the rate of increase has slowed up.

[1]Young, tender chickens under 16 weeks of age are known as *broilers* or *fryers*. The term *broiler* is used in the bulletin.

Why the rapid increase?

Several reasons account for the increase in broiler numbers in the past 15 years. During World War II and the post-war years, poultry-meat consumption increased because of the availability of birds and of relatively low prices.

Both male and female chicks were sold by hatcheries up until about 15 years ago. For egg production, the demand is largely for sexed pullets, and most of the cockerels are destroyed. Today broiler growers select meat strains rather than cockerels from egg-producing breeds.

From the standpoint of labor efficiency, one man can raise more pounds of meat with broilers than with any other form of livestock. It is possible for him to raise 400 thousand pounds of broiler meat in a year, which is equal to approximately 2000 hogs. One man would find it difficult to raise more than 1000 hogs in one year.

At present on a live-weight basis, broilers use their feed more efficiently than any other form of livestock. Some broiler men can grow a pound of chicken with only 2.7 pounds of feed. Today only hogs

can compare with broilers in the efficient use of feed. Furthermore, broilers can be grown in any part of the United States, and they will do well where other crops will not.

Future of the broiler business

In 1940 many persons felt that the broiler business had reached its peak, but it was just starting. Some persons today think that the broiler business cannot get any larger; others who are optimistic think that it is still in its infancy. Broiler numbers probably will not increase so rapidly as they have in the past ten years because broiler production is catching up with consumption. If, however, every person in the United States would eat 1 pound more young chicken each month, which isn't much, the broiler industry even as it is today would double.

The consumption of poultry meat has increased tremendously during the past few years. In 1940 each person in the United States ate an average of 19 pounds of chicken each year. In 1952 the consumption climbed to 32 pounds per person, which is an increase of 68 per cent. One major reason for this increase was the availability of young, tender chicken at reasonable prices.

Young meat chickens have added variety to the menus. Twenty years ago fowl was the most readily available source of poultry meat and was used for stewing. Today the housewife can buy a fowl, a roaster, or a broiler. She can now stew, roast, fry, or broil poultry. Moreover, it is purchased ready-to-cook, whereas formerly it had to be drawn. This improvement in marketing is a major reason for the increase in consumption.

Broiler Production in New York State

Where grown

Broiler production in New York State is concentrated in a few areas. Most broilers are now grown on Long Island and in Sullivan County, areas near New York City. Many of the broilers grown in Sullivan County are hormonized Barred Rocks, from 4 to 5 pounds in weight, and are for the Jewish trade in New York City. Recently, other areas in the State have increased their production of broilers. The lower Hudson Valley in general, and particularly Ulster County, has shown a marked increase in numbers. Central New York counties, especially Cortland, Tompkins, Tioga, Cayuga, and Onondaga, have shown an increase in broiler numbers. Broiler growing is carried on in Chautauqua County, in western New York, and may well spread to adjoining counties.

Supply

Although New York State raised about 9 million broilers in 1952, as compared with 3 million in 1940, New York's production is still small compared with that of many States. In 1951 New York ranked twenty-first among the States in the United

States in the number of broilers grown. Approximately 85 per cent of the broilers consumed in this State are from other States.

There are many reasons why New York does not raise more broilers. First of all, New York can raise a variety of agricultural products. In many of the larger broiler States there are fewer alternatives. Moreover, egg production for table use has been profitable, because of New York's nearness to market, and has competed with the broiler business. Many broiler growers retail a quantity of poultry meat here in New York State and, since that requires more labor, they cannot raise so many chickens in a year. Another reason why New York has not been a large broiler State is her lack of large dressing plants. Farmers are not likely to raise broilers if there is no definite market for them. At present a few dressing plants are being built which may change the picture.

Markets

New York City is the largest poultry market in the world. Other excellent markets are Buffalo, Rochester, Syracuse, Binghamton, Utica, and Albany. These are probably more promising for many New York State poultrymen than New York City because competition is not so keen. New York, compared with other States, has the advantages of nearness to the large markets and preference for nearby poultry. All of the cities mentioned have wholesalers who buy broilers locally if they can obtain the quality and quantity desired. Since New York State has the markets, poultrymen should make use of them.

Feed costs

The cost of mash in New York State is usually less than in most States because Buffalo is a large feed-milling city. Grain costs are higher than in the Midwestern States. If, however, the broilers are sold when they reach from 2½ to 3 pounds live weight, grain is usually a minor part of the diet.

Climate

New York State climate is favorable for broiler growing. While the winters are colder than in the Southern States, this is not a great disadvantage because heating during the brooding period is not a major cost. The summers are satisfactory for the broiler business.

Cost of Producing Broilers

About 90 per cent of costs in producing broilers is for feed, chicks, and labor. Feed at present prices make up about 70 per cent of the total cost, chicks account for about 15 per cent, and labor for about 5 per cent. It is difficult to state definitely what it costs to produce broilers because prices vary from locality to locality, and costs are different on each farm. Only approximate figures can be given.

The following formula can be used to estimate production costs

Table 1. Average Costs of 228 Broiler Producers, Virginia, 1946-1948.*

Costs	1946–1947		1947–1948	
	Average of 104 records, Rockingham County		Average of 124 records, valley and shore farms	
	Cost per 1000 started	Percentage of total	Cost per 1000 started	Percentage of total
	Dollars	*Per cent*	*Dollars*	*Per cent*
Feed	608	67.3	615	68.1
Chicks	143	15.8	147	16.3
Labor	83	9.2	47	5.3
Miscellaneous†	35	3.8	47	5.2
Building and equipment	25	2.9	36	4.0
Interest on operating capital	10	1.0	10	1.1
Total	904	100.0	902	100.0

*From *Good Broiler Management Pays*, by J. S. Plaxico, Virginia Agr. Exp. Sta. Bul. 473. 1949.
†Includes fuel, litter, medicines, automobile, truck, team, hauling, and other minor costs.

per pound of meat. The formula, while not entirely accurate, gives a rough idea of what the costs are.

Formula

Pounds of feed to make a pound of meat × price of feed per pound = feed costs per pound

0.35 × cost of 1 chick = chick cost per pound

2 × cost per minute = labor cost per pound

For example, suppose that a poultryman produces 1 pound of broiler with 3.5 pounds of feed which costs 5 cents a pound. The chicks cost 15 cents each and he valued labor at 60 cents an hour.

3.5 × 5 cents = $0.1750 (cost of feed)

0.35 × 15 cents = $0.0525 (cost of chicks)

2 × 1.0 cents = $0.0200 (cost of labor)

Total of three items = $0.2475 (cost of chick, feed, and labor)

$0.2475 × 1.1 = $0.2722 (total cost per pound)

The figure, 0.35, adjusts the cost of chick to cost per pound and allows 5 per cent mortality and an average weight at selling time of 3 pounds. On the average broiler farm in New York State, it takes approximately 6 minutes of labor to care for a broiler, or 2 minutes per pound, based on 3-pound broilers. Since feed, cost of chick, and labor make up about 90 per cent of the total costs, the total of the three items should be multiplied by 1.1 to give the total costs. The figures used in the example are not accurate for all broiler farms. Large, efficient operators should be able to produce broilers somewhat cheaper.

Business Management

DECISIONS that one makes before buying the chicks play a major role in success. Some broiler growers who are excellent caretakers of poultry are not successful because they lack business management. To be successful, growers must consider size of operation, production practices, when to start chicks, labor efficiency, and selection of stock.

Size of Operation

In general, broilers are raised in large flocks. With labor-saving equipment, it is possible for one man to care for as many as 15,000 to 20,000 broilers at one time. With the birds' increase in growth rate during the past few years, some poultrymen now raise four groups of broilers in one year where formerly they could grow only three lots. Most broiler growers average about three and one-half lots. In some areas it is not unusual for one man to care for 100,000 broilers in one year. With this mass production, detailed attention cannot be given the birds.

The bulk of the broilers in New York are in flocks of 500 to 5000. Many are raised as a sideline to other agricultural enterprises, such as laying hens, dairy, and fruit, or are raised by part-time farmers. Most of the farmers who raise broilers as a secondary enterprise grow only one flock each year. Quite a few of the growers who dress and retail their birds raise only a few thousand broilers a year and depend on marketing to supplement their income. Recently a few men have gone into the broiler business as a full-time job. Those who plan to sell broilers alive should grow from 30,000 to 40,000 per person each year. Growing fewer broilers does not insure a good living unless one dresses them and carries on more of the job of marketing or raises them to a heavier weight.

Size of business affects costs which affect profits (table 2). With a large-size business, the greatest saving is on labor because labor-saving devices can be justified. In flocks with fewer than 2000 broilers, the labor cost was more than 5 cents per pound of broiler. In the flocks of 10,000 broilers or more, however, the cost was only 1.5 cents per pound.

Production Practices

Where possible, it is wise to follow the "all-in–all-out" practice. This consists of filling the space to capacity at one time and selling all the broilers at once when they are ready for market. Time should be allowed between breeds to clean the house thoroughly and to let it stand for several days. Because of the excellent retail outlets, some growers follow a weekly plan of putting in chicks each week to have a constant supply of marketable broilers. Practically all broiler growers who use this weekly system do their own marketing. The weekly system is not recommended because of the

Table 2. Relationship of the Number of Broilers Started to Costs per Pound of Broiler Sold

(122 lots of broilers, New York State, 1951–1952)*

Items	Number started			
	Fewer than 2,000	2,000 to 3,999	4,000 to 9,999	10,000 and more
Lots (number)	26	29	37	30
Birds started per lot (number)	1,197	2,773	5,428	16,901
Percentage mortality (per cent)	6.8	9.0	6.4	7.4
Age at sale (weeks)	13.6	14.7	11.9	13.9
Weight at sale (pounds)	4.1	4.3	3.5	4.2
Feed per pound of meat (pounds)	3.9	4.1	3.5	3.7
Average weekly gain per bird (pounds)	0.306	0.291	0.298	0.299
Labor per bird (minutes)	12.2	8.2	4.1	3.5
	Cents per pound			
Costs:				
Feed	20.7	20.9	19.6	19.9
Chicks	4.0	3.9	4.7	4.2
Labor	5.3	3.4	2.1	1.5
Buildings, equipment, truck, tractor, automobile	5.0	4.3	2.8	3.0
Fuel and electricity	1.2	0.9	0.9	0.6
All other	0.7	0.6	1.0	1.0
Total costs	36.9	34.0	31.1	30.2

*From *Broiler Production in New York State, 1951–1952* by Gilbert W. Biggs. A.E. 846, Department of Agricultural Economics, Cornell University. 1953.

disease hazard. When old and young birds are on the same farm, especially in the same house, one is likely to have trouble. The older birds may pass diseases on to the younger ones. If a respiratory disease should occur, the disease goes through the entire flock. To stop the disease, it is necessary to discontinue starting chicks until all the older birds are sold.

When to Start Broilers

An interesting development has been the gradual introduction of broilers on the market from a few months of the year (May, June, July, and August) to all months. In the early 1930's broilers were high in price in the late winter and early spring months when they were scarce and low in the summer when they were plentiful. Today, broilers are grown the year round. The price does vary some, but there is no set pattern. The price of broilers, however, is definitely affected by the number started from 10 to 12 weeks prior to date of sale. It is wise to follow broiler placement reports put out by the United States Department of Agriculture and by the Departments of Agriculture of the various States.

Labor Efficiency

Poultrymen can do little to change the price of feed or the cost of the baby chick. They can, however, do many things to cut down the cost of labor. Commercial broiler growers can use labor-saving devices, such as large pens, automatic feeders, automatic waterers, elevators, and the like. It takes only a little more time to care for a large pen of broilers than it does for a small one. In a large pen, equipment can be arranged more satisfactorily to save labor than in a small pen. All commercial broiler growers use automatic waterers in their poultry houses.

With labor scarce and expensive, automatic feeders have a place on broiler farms. There are many different makes on the market and most can be adjusted in height so they can be used during the entire growing period. The main disadvantage of automatic feeders is that the growers have a tendency not to go into the pens often enough to see what is going on. When feeding by hand, one is likely to give more attention to the birds. The poultryman who does not want to invest in an automatic feeder can line the mash hoppers end to end and run them the long way of the pen. With the barn-door track and feed carrier, the feed can be taken from the carrier and dumped into the line of feeders.

In multiple-story houses, elevators or some other device should be used to get the feed to the upper

Figure 1. It is important to save labor on a broiler farm. Note the automatic feeder and watering trough in this pen of Barred Rock broilers for the New York City trade.

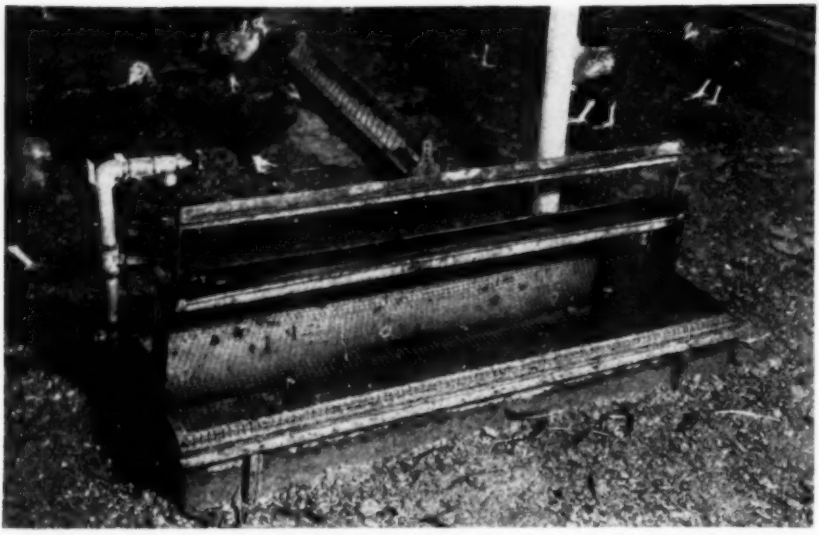
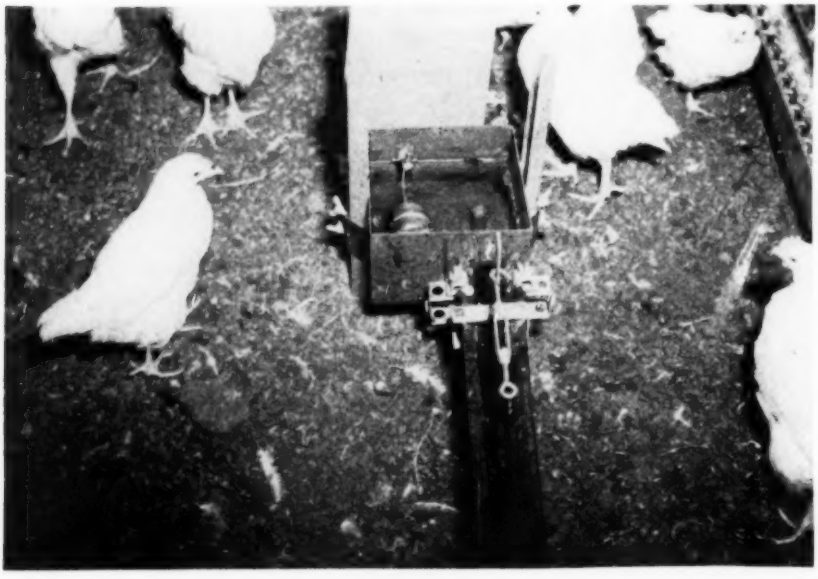


Figure 2. A continuous flow of water is helpful on farms where water is plentiful. Note the petcock to regulate the flow of water.

Figure 3. In angle iron waterers the flow may be continuous or controlled by a float as shown here.



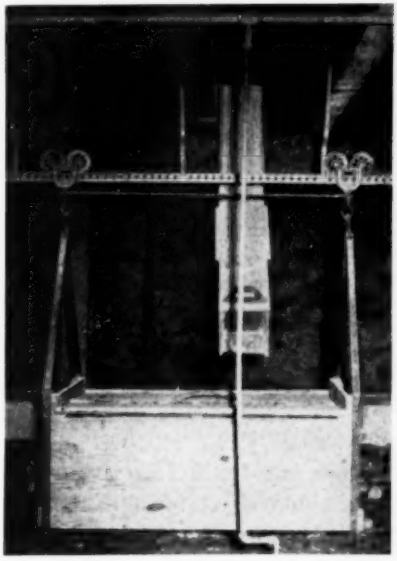


Figure 4. A feed cart on a barn-door track saves time and labor. Note the feed chute from the storage bin on the floor above.

Table 3. Relationship of Labor Efficiency to Costs per Pound of Broilers Sold*
(122 lots of broilers, New York State, 1951–52)

Items	Minutes of labor per bird			
	Less than 3.0	3.0 to 5.9	6.0 to 8.9	9.0 or more
Lots (number)	30	44	28	20
Birds started (number)	8,360	8,925	4,773	2,111
Percentage mortality (per cent)	6.0	7.6	6.9	13.4
Age at sale (weeks)	11.7	13.8	14.9	15.7
Weight at sale (pounds)	3.6	4.1	4.3	4.6
Feed per pound of meat (pounds)	3.4	3.9	3.6	4.8
Average weekly gain per bird (pounds)	0.305	0.298	0.292	0.290
Labor per bird (minutes)	1.8	4.0	7.3	16.3
	Cents per pound			
Costs:				
Feed	18.0	20.8	19.8	23.9
Chicks	4.5	4.3	3.9	3.5
Labor	0.9	1.7	3.0	6.5
Buildings, equipment, truck, tractor, automobile	3.2	2.9	2.9	5.9
Fuel and electricity	0.7	0.7	0.6	1.0
All others	0.6	1.2	1.0	0.7
Total costs	27.9	31.6	31.2	41.5

*From *Broiler Production in New York State, 1951–1952* by Gilbert W. Biggs. A.E. 846, Department of Agricultural Economics, Cornell University. 1953.

floors. In the larger, deeper houses some way should also be provided to save labor in removing the manure. Many broiler growers have arranged their houses so a truck or tractor with a manure spreader can be driven into the pen for cleaning. By use of trapdoors in multiple-story houses, one can push the litter from upper floors to a lower floor or directly into a truck or spreader. Elevators can be used to take the manure from the pen through a window into a truck or manure spreader.

How labor efficiency can cut costs is shown in table 3. Where less than 3 minutes were spent on each broiler, the labor cost per pound was less than 1 cent. On those farms where labor took more than 9 minutes per bird, the cost was 6.5 cents for each pound of broiler.

Good Stock

Good stock is one of the most important contributions to success in the broiler business. Many broiler growers do not succeed because they fail to get good stock. It is important to buy chicks that are bred for meat production. If possible, one should buy broiler chicks near home, because chicks shipped a long distance may pick up a disease enroute or may be chilled or overheated. Persons who buy chicks from a long distance could probably buy just as good, if not better, stock nearby. When buying broilers, it is important to consider rate of growth, efficient use of feed, mortality rate, fleshing, rate of feathering, color of feathers, uniformity of size, and the various breeds or crosses that meet the requirements for profitable broilers.

Rate of growth

Rate of growth is inherited. Some breeders have bred fast growth into their strains. The faster the birds grow, the less feed it takes to make a pound of gain and the quicker it reaches market age. Some broilers are ready for market at 10 weeks of age, while others take 12 or 13 weeks. Rapidity of growth then affects the number of broilers one person can raise in a year.

Sex, disease, management, and adequacy of the diet, as well as inheritance, affect the rate of growth. It is known that males tend to grow more rapidly than do females. Disease slows growth, but the extent is determined by the type of disease and its severity. Poor management, including crowding, irregular feeding and watering, not enough ventilation, and over or under heating, results in poor growth. An inadequate diet also causes a bird to grow poorly.

Good feed efficiency

Since feed accounts for approximately 70 per cent of the total cost of growing broilers, the efficient use of feed by the birds should be considered. One should select the strain that is known to use feed efficiently. It is also true that some feeds give better feed efficiency as far as producing meat is concerned than others, although most commercial

feeds on the market today are considered to be efficient. The weight of the broilers also affects the efficient use of feed by the birds – the older and heavier the bird, the more feed is needed to maintain body weight. For the efficient use of feed, it is best to sell broilers when they are light in weight. This may not be the most economical since light broilers may not bring a good price; but if the price spread between light and heavy broilers is not great, then the birds should be sold at an early age. Some broiler growers sell their birds when they weigh about 2½ pounds, and are as young as 8 weeks. It is possible at that weight and age to get feed conversion of less than 3 pounds of feed to make 1 pound of gain.

Disease also affects feed efficiency. If broilers are troubled with disease for a long time, it may take as much as 6 pounds of feed to make 1 pound of gain. The difference in feed efficiency determines profit or loss.

The importance of feed efficiency is shown in table 4. Those growers who produced 1 pound of broiler on less than 3 pounds of feed had

Table 4. Effect of Pounds of Feed Used per Pound of Meat and Cost per Pound of Broiler Sold

(122 lots of broilers, New York State, 1951–52)*

Items	Pounds of feed used per pound of meat			
	Less than 3.0	3.0–3.4	3.5–3.9	4.0 or more
Lots (number)	14	30	42	36
Birds started per lot (number)	5,338	5,951	8,687	5,591
Percentage mortality (per cent)	4.6	6.8	6.9	9.3
Age at sale (weeks)	11.2	11.6	14.1	14.9
Weight at sale (pounds)	3.5	3.6	4.1	4.4
Feed per pound of meat (pounds)	2.8	3.2	3.8	4.4
Average weekly gain per bird (pounds)	0.314	0.315	0.293	0.292
Labor per bird (minutes)	2.8	2.8	4.7	6.3
	Cents per pound			
Costs:				
Feed	14.8	17.1	20.6	22.7
Chicks	4.5	4.6	4.2	4.1
Labor	1.4	1.4	2.0	2.6
Buildings, equipment, truck, tractor, automobile	3.0	2.7	2.9	3.9
Fuel and electricity	0.7	0.8	0.7	0.8
All other	0.5	0.5	1.3	0.8
Total costs	24.9	27.1	31.7	34.9

*From *Broiler Production in New York State, 1951–1952* by Gilbert W. Biggs. A.E. 846, Department of Agricultural Economics, Cornell University. 1953.

Table 5. Relationship between Age at Sale and Costs and Returns
(293 lots of broilers, Rockingham County, Virginia, 1946–47)*

	Age at sale (weeks)				
	Less than 12	12.0–12.9	13.0–13.9	14.0–14.9	15.0 and more
Lots (number)	31	83	82	49	48
Age at sale (weeks)	11.4	12.4	13.4	14.4	16.3
Average size lots (number)	2,028	1,962	1,849	1,639	2,279
Percentage mortality (per cent)	5.9	9.7	9.6	11.3	14.1
Weight at sale (pounds)	2.9	3.0	3.2	3.3	3.6
Feed per pound of meat (pounds)	4.1	4.2	4.2	4.4	4.7
Rate of growth (pounds)	3.6	3.5	3.4	3.3	3.2
Labor daily per 1000 started (minutes)	1.9	1.9	1.8	1.9	1.4
Weekly death rate per 1000 started (number)	5.2	7.8	7.2	7.8	8.6
	Cents	*Cents*	*Cents*	*Cents*	*Cents*
Returns per pound meat	32.2	31.7	32.1	31.0	31.2
Costs per pound meat	30.7	31.1	31.1	32.8	32.2
Net gain per pound	1.5	0.6	1.0	−1.8	−1.0
Returns per hour labor	78.2	59.7	68.0	22.0	28.9

*From *Broiler Costs and Returns Related to Management Practices, Rockingham County, Virginia, 1946–1947* by James S. Plaxico. Virginia Agr. Exp. Sta. Bul. 426. 1949.

a production cost of only 24.9 cents per pound. On the other hand, if the feed conversion was above 4, the total costs were 34.9, or a difference of 10 cents. At a 24.9 cent production cost, one could make money almost anytime. At a cost of 34.9 cents per pound, however, one would need a good market to break even.

It is best to sell broilers at a young age unless the price received for older birds justifies keeping them (table 5). In the study in Virginia, broilers sold before they were 12 weeks old returned 78.2 cents per hour of labor. Those 15 weeks of age and more before being sold returned only 28.9 cents an hour.

Disease resistance

The broiler grower should do everything possible to keep mortality low regardless of whether he is a large or small operator. Mortality not only causes a loss from the standpoint of money paid for the chicks, but it also means that the feed, labor, and the like that is invested in the bird up until death is a total loss.

The first step in keeping mortality low is to buy good stock — stock that is known to be vigorous and to live well. Disease resistance can be inherited. It is important that the breeder or hatcheryman from whom the chicks are pur-

chased has stock that is free from pullorum disease. Some strains of birds are more resistant to leucosis than are others.

The second step in keeping mortality low is to practice good management. One cannot practice poor management and expect the chicks to live. To keep mortality low, one must have a general knowledge of poultry diseases. As soon as disease is detected, a trained pathologist should be consulted and an accurate diagnosis made. Treatment, if possible, should start as soon as one knows what the disease is. In New York State, the only vaccine used for broilers to date is for Newcastle disease. The vaccine (internasal or interocular) is applied into the nostril or onto the eyeball soon after the chicks are hatched. Many hatcheries do the vaccinating themselves. One should strive to keep the loss in broilers less than 5 per cent.

In a survey made in New York State in 1951 and 1952 on 122 groups of broilers, the average mortality was 7.3 per cent. The lowest mortality found on any farm was 1.6 per cent and the highest was 14.1 per cent. How high mortality can affect the cost per pound of broiler grown is shown in table 6.

Good fleshing

When Mrs. Consumer goes into the meat market to buy broilers,

Table 6. Effect of Mortality on Cost per Pound of Broiler Sold*

Item	Percentage of mortality		
	Less than 4	4.0–7.9	8 or more
Lots (number)	31	5	40
Birds started per lot (number)	4,022	7,524	7,774
Percentage mortality (per cent)	2.5	6.2	10.5
Age at sale (weeks)	12.1	13.4	14.1
Weight at sale (pounds)	3.8	4.0	4.2
Feed per pound of meat (pounds)	3.4	3.6	4.0
Average weekly gain per bird (pounds)	0.312	0.297	0.296
Labor per bird (minutes)	4.2	4.2	4.9
	Cents per pound		
Costs:			
Feed	18.4	19.5	21.2
Chicks	4.3	4.2	4.3
Labor	2.0	1.9	2.1
Buildings, equipment, truck, tractor, automobile	2.8	3.1	3.4
Fuel and electricity	1.0	0.7	0.7
All other	0.6	0.9	1.0
Total costs	29.1	30.3	32.7

*From *Broiler Production in New York State, 1951–1952* by Gilbert W. Biggs. A.E. 846, Department of Agricultural Economics, Cornell University. 1953.

she chooses one that is well fleshed. She knows that the better fleshed birds will give her a higher yield of edible meat. There is therefore a definite demand for well-fleshed broilers. Dressing-plant operators to a certain extent determine the price that they pay producers on fleshing. Fleshing is inherited, so one should start with stock that has the ability to produce a high proportion of flesh to bone. One normally checks fleshing in the breast. The thicker the breast meat over the bone, the better.

Rapid feathering

Broilers should be entirely feathered when they go to market, which may be as early as 8 to 10 weeks of age. Broilers with pinfeathers not only sell for a lower price but are not wanted on many markets. Dressing plants do not like to buy poorly feathered birds because of the labor involved in picking. The consumer prefers not to buy a carcass covered with pinfeathers.

Many of the heavy breeds do not feather rapidly. However, one has no trouble today to find strains in most breeds that feather in time for broiler market. New Hampshires as a breed feather rapidly. Leghorns are a fast feathering breed, but are not popular for meat unless one has a special trade.

Uniformity of size

Flocks of broilers always sell better and generally for a better price if they are uniform in size. Dressing-plant operators dislike dressing broiler flocks that have many different sizes, for it means sorting and the small lots of different sizes create a selling problem. Usually the smaller birds in non-uniform flocks are not so good in quality as the rest. Uniformity is inherited, and some strains are much better than others. Antibiotics in the feed do to a certain extent prevent runts.

Color of feather

The feather color of the broilers depends on the market. In eastern New York many broiler growers sell their birds alive on the Long Island City Market. On that particular market, barred-feathered birds are in demand.

Broiler growers who depend on dressing plants for their market find that broilers with light-colored feathers are in demand because light-colored birds clean better. Any pinfeathers that should remain do not show readily. The demand today on the dressed market seems to be for a white bird or one with light undercolor. Most broiler growers who do their own dressing prefer the light-colored breeds because of the appearance of the carcass.

Merits of the popular breeds, strains, and crosses for broilers

Broilers to be outstanding should grow fast, use feed efficiently, have low mortality, be well fleshed, feather rapidly, be uniform in size, and have a feather color that is acceptable. With this information, one is ready to consider buying the

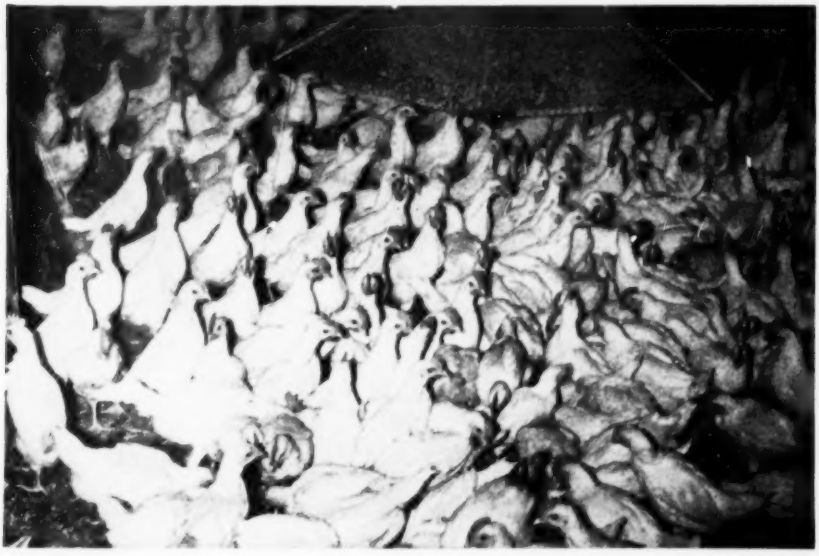
chicks. Very few broilers meet all of these qualifications. Among the pure breeds, New Hampshires and White Rocks are the better qualified. Even with these two breeds, only a relatively few strains make top-quality broilers. A number of new breeds are becoming available. Time alone will tell whether they can supplant the present popular breeds and crosses. Several crosses on the market make excellent broilers. By crossing, it is possible to get good characters from two or more breeds. Of course, there are great differences among the same cross from different sources just as there are differences among strains of the same breed.

Certain market demands may determine the breed or cross to grow for broilers. For live broilers in New York City, there is a demand for a barred-feathered bird. Growers who use this market raise Barred Rocks or a Barred Cross even though other breeds or crosses may make better meat birds.

In New York State there is a demand for Leghorn broilers for hotel and restaurant trade. Many hotels and restaurants like to buy small broiler halves, and Leghorns fulfill their requirements. Leghorn broilers are also popular during the summer months for barbecues.

Although Leghorn broilers do not have the best meat type, they have other desirable characteristics. Up until 8 weeks of age, they use their feed efficiently and grow fast. Most strains of Leghorns have a low mortality rate and feather rapidly. Their white feathers are an advantage.

Figure 5. White feathered broilers are in demand. Leghorns are profitable if one has a market for them.



Day-old Leghorn cockerels are cheap because of their limited use. One can usually make money by growing them to 8 or 9 weeks of age, dressing them and selling the halved broilers. If hormonized three weeks before market, their meat is of excellent quality.

"Straight-run" or sexed

In New York State some broiler growers have the opportunity to buy sexed cockerel chicks. One should buy cockerels if possible because they make faster gains. With good broiler stock, however, it is difficult to buy only the cockerels. Because of this, most of the broilers grown are "straight-run" (half cockerels and half pullets).

Broiler Houses

THE ideal broiler house has several requirements. It should be wide so the pens are large, because large pens allow for labor-saving devices, are easier to work in, and generally can be more easily ventilated. Wide houses are cheaper to construct because there is less wall space for a given amount of floor space. Experience has shown that it is not practical, however, to build a house more than 60 feet wide because of the lack of light in the center.

In New York State, the ideal broiler house should be insulated to conserve the heat used in brooding. Because of the cold winters, insulation is more necessary than in the milder climates. Insulation is also needed in the summer months to keep the temperature down so the broilers will consume plenty of feed. Most heat loss is through the roof, so it is imperative to insulate the roof.

Many growers who raise broilers only as a sideline enterprise use any

Figure 6. A dairy barn converted into an excellent house for broilers.

buildings that are available. Such buildings are not always ideal, but they seem to grow broilers. Some commercial egg producers grow broilers when not rearing pullets, to utilize their brooding buildings and equipment. On many farms the housing consists of one or more colony brooder houses. On other poultry farms, the permanent brooder house is used for broilers when the replacement stock has been moved out.

Commercial broiler growers in the State have either built new houses or converted old dairy barns into poultry houses. With the new buildings, there seems to be no particular standard. In the past few years wooden buildings have been more popular than masonry buildings because of the availability of lumber. Single-story houses have gained in popularity. Many old dairy barns make excellent broiler houses because they are wide and provide ample circulation of air to keep the litter dry, but an old barn should never be converted into a poultry house unless it has a good foundation and a solid frame. Anyone in the State who is interested in building a broiler house or converting an old dairy barn can obtain the assistance of a district agricultural engineer by consulting his county agricultural agent.

Ventilation

Ample ventilation is needed by both the broilers and the operator. About every method of ventilating a broiler house is used in New York State, including windows, rafters, flues, and electric fans. Some heating units, particularly electric and bottled gas, do not appreciably heat

Figure 7. A large, simple house for broilers.

Figure 8. A typical broiler house for a part-time operator.

Figure 9. Two fans are suggested for each pen or house. The fan on the left with the flue to within 20 inches of the floor runs continuously after the first week of brooding. The fan on the right is thermostatically controlled and runs only when the temperature gets above 50° F. During mild weather, the trap door on the duct is lowered and both fans draw warm air from near the ceiling.

the room and ventilation can be a difficult problem.

Most new broiler houses, including converted barns, have electric fans for ventilation because growers feel that fans eliminate the human error, are easier to install, and in general insure better ventilation. With their use, less window space is needed, which cuts both the cost and the heat loss; and with less window space, cannibalism is not likely to be a serious problem. In summer, fans keep the air in circulation which in turn has a cooling effect on the birds.

Brooding Systems

Two general types of heating systems are used in New York State: (1) individual units and (2) central heating. Individual brooding units are used in smaller enterprises and by some commercial people. Central heating is used only by the larger commercial broiler grower.

Individual Units

The individual units are either warm-room or cold-room brooding systems. The warm-room brooding stoves heat the entire room, while the cold-room units heat only under the hover. Warm-room brooding is probably more satisfactory during the cold months because it is easier to ventilate the house and to keep the litter dry. Furthermore, in case of disease, especially a respiratory one, mortality can be kept lower with warm-room brooding than with cold-room brooding because the room temperature can be raised which keeps the chicks from crowding.

Cold-room brooding has advantages, particularly during the warmer months. Cold-room brooding saves labor as the heaters are automatic and the fire hazard is usually less. Healthy chicks respond favorably to a cool room if they have some place to go to get warm.

Warm-room brooder stoves

Wood burners. Few wood burners are used in New York State. They produce a steady even heat and are economical on those farms where wood is available.

Coal stoves. Coal stoves take more labor than other stoves and there is a potential fire hazard with the ashes, but the steady, uniform heat from coal has its advantages for broiler growing. In the past few years, the cost of coal has limited their use, but costs vary according to local price of coal and to weather conditions. Most broiler growers figure from 2 to 5 cents per bird.

Oil stoves. Kerosene oil stoves are popular in some sections of the State and the cost of heating is somewhat more than for coal—about 3 cents per bird in mild weather and 5 cents in cold weather. Oil brooder stoves have the reputation of being a fire hazard; but with the modern stoves the chance of a fire is quite remote.

Figure 10. Many growers with small flocks like coal as fuel for their brooders.

Figure 11. Gas brooders are becoming popular because of the ease of operation. Note the cardboard guards to keep the chicks close to the source of heat for the first week.

Cold-room brooding units

Bottled gas. Bottled gas is becoming popular. In some areas the gas is cheaper than in others. Bottled-gas brooders are automatic and one does not have to worry about power failures. Most bottled gas units heat only under the hover, although some heat does escape into the room. In the combustion of propane gas, water is given off, which means that ventilation must start from the first day. The cost per bird ranges from 2 to 4 cents, depending upon the weather and price of gas. Where natural gas is available, it is a cheap and satisfactory method of heating.

Electric hovers. The use of electricity for brooding is popular in New York both for large and small growers. Wet litter is a problem in cold weather because the room is not heated. If power failures are common, one should either provide emergency power or not use electricity. Electric brooders need little attention, which is one reason for their popularity. If brooding in cold weather, the house should be insulated. The cost to brood by electric hovers is from 2 to 3 cents per bird.

Infra-red. Some growers use infra-red bulbs because of the ease in working with the chicks. The cost is from 4 to 6 cents per bird. Infra-red should be used only in insulated buildings and auxiliary heat is needed if the room temperature gets below 40° F. Some broiler growers use hovers with infra-red to conserve the heat. With a hover, auxiliary heat is not necessary.

Central Heat

Central heat is popular in the concentrated broiler areas in New York State, and it is more popular among the larger growers. In this State the following central heating systems are used: hot-water pipes above floor, space heaters, hot air, and floor heat. With all central heating systems, the initial cost is fairly high but from there on the cost of heating is low. They are easier to work with and there is less fire hazard and less labor. One should start at least 2000 broilers at one time to justify central heating.

Hot-water pipes above floor

Hot water is the most popular central-heating system among commercial broiler growers in New York State. It consists of a boiler and hot-water pipes which run through the pen above the floor. Most poultrymen use either coal or oil for fuel. The pipes are placed from 10 to 15 inches above the floor, depending on the width of the room. Some poultrymen put the pipes in the center of the pen to prevent any birds from smothering and to prevent a heat loss through the wall. Others place the pipes along the rear or front wall or both so they are not in the way. The hot-water pipes are usually from 1¼ to 1½ inches, inside dimsenion, and the number of pipes used depends on the width of the room. Usually building paper

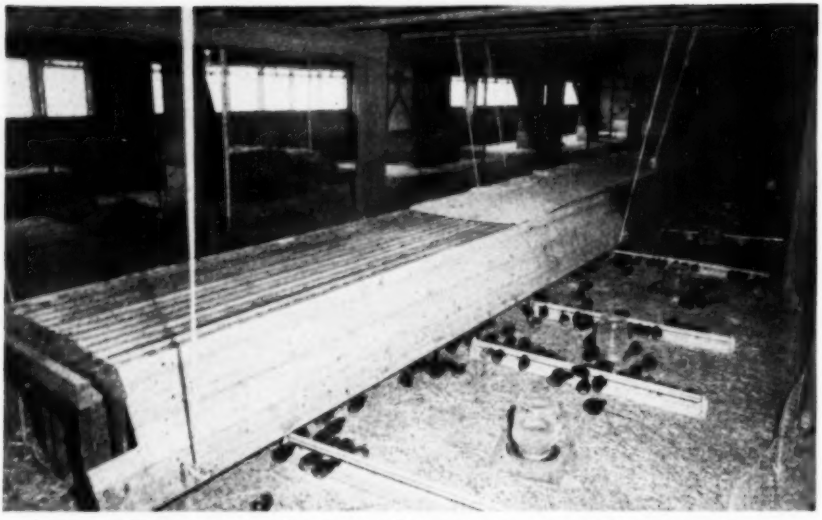


Figure 12. Hot water brooding is popular among commercial broiler growers. Note the wood deflectors to keep the heat under the pipes when the chicks are small. Insulation board is used to act as a hover over the pipes. This pen is 50 feet wide and 70 feet long. Twelve 1¼-inch pipes are used and they are 16 inches from the floor. Note also the arrangement of feeders and waterers.

or some sort of insulating board is put over the pipes when the chicks are young to keep the heat under the hover. As chicks get older, the building paper is removed and the heat is spread more evenly throughout the room. Most broiler growers report that it costs from 1 to 2 cents to heat with hot water. Fin tube radiators can be used in place of pipes.

Space heaters

Space heaters have made their appearance in New York State for brooding. They have been used for years in garages and other buildings. Hot water, steam, and gas space heaters are on the market.

Figure 13. The use of space heaters for broilers is comparatively new in New York State.

Bottled-gas space heaters are the most popular for brooding because of cost of the unit, ease of setting up, and because they are portable and can be moved from one pen to the other. Bottled-gas space heaters have an advantage over brooder stoves using the same fuel because the water vapor is flued out. Many poultrymen use a temporary partition with space heaters to make a small room when the chicks are small. As the chicks grow and need less heat, the partition is moved to make more room. One of the advantages of space heaters is the ease of working in the pen with no obstacles in the way.

Hot air

There are a few hot-air furnace brooding systems in New York State. A large pipe runs the length of the pen with small outlets for hovers. Installation costs for forced hot-air systems are cheaper than for hot-water pipes above the floor, but the cost of operating is usually higher.

Floor heat

Hot-water pipes are buried in the concrete floor. The cost of installation is so high that floor heat has not become popular.

Battery Brooders

Some New York broiler growers raise their birds in batteries. Most of these live near a large city where space for poultry houses is limited. With batteries it is possible to get more broilers into a small area.

One of the main disadvantages of battery brooding is the high initial investment. For growers who live near metropolitan areas where property and buildings are expen-

Figure 14. Some commercial broiler growers use hot air for brooding heat.

sive, battery brooding may be cheaper.

Most broiler growers who have batteries also have a retail route, which means that they always have to have a supply of birds, but they must start a new group each week. This is easily done with batteries for as soon as one battery is empty it can be filled immediately with new stock. The main disadvantage of raising broilers in batteries with a new group each week is the danger of disease. If a disease should get started, it is almost impossible to eliminate it without selling all the birds and starting over again. The disease hazard has discouraged many broiler growers from using batteries. When raising broilers in batteries, one should do everything possible to have each age in a separate room. It is also important not to allow visitors to come on the premises because the hazard of carrying disease is too great.

Management of the Flock

Good management is essential in the broiler business. Often several broiler men use the same strain of birds and even use the same feed, yet some raise good broilers and other do not. The difference is in the management of the stock. Good management includes a good feeding program, proper feeder space, adequate watering facilities, ample floor space, good litter conditions, a knowledge of lighting, and prevention of cannibalism.

Feeding

In the past few years New York broiler growers have been able to obtain tremendous weight gains in their birds through proper feeding. In the New York State Chicken-of-Tomorrow Contest, broilers weighed 5 pounds at 12 weeks of age. Some poultrymen have been able to obtain a 4-pound average when the broilers are only 12 weeks old. To be successful in the broiler business, one must get the most broiler weight possible in the shortest time.

When starting the chicks, the grower may use either chick grain or starting mash. Some poultrymen start the chicks on grain and feed it for one or two days. Usually there is less "pasting" than with a starting mash. Those who start the chicks on mash realize they may get some pasting, but they feel they get more rapid gain the first few days. Research has shown that in 8 weeks time it does not make too much difference whether mash or grain is used at the start.

Many broiler growers feed only mash until the broilers go to market. Some supplement the mash with pellets to increase the feed intake, starting when the broilers are about 6 weeks of age. Pellets fed alone for a long period of time encourage cannibalism. The reason for this is not exactly known, but it is believed that the birds satisfy their appetite in a short time and have more free time to get into trouble. Some broiler growers use

grain, especially corn, with the mash during the last two or three weeks to produce a better finish. If the broilers are kept until they weigh 4 or 5 pounds, some growers feed grain with the mash for as long as 6 or 7 weeks. Sometimes finishing rations are so used.

Most growers buy a commercially manufactured feed. It is important to follow the directions of the manufacturer when feeding such a mash. Current formula recommendations for broiler rations can be obtained from the Department of Poultry Husbandry, at Cornell University.

Improvements in broiler rations have resulted from increased energy value, vitamin fortification, and the use of antibiotics, all of which have contributed to more rapid and efficient growth.

Most broiler growers supply chick grit in limited quantities by providing it one or two days each week.

Feeder space

To eat all the feed they possibly can, broilers need plenty of feeding space. At least one-half of the broilers should be able to eat at one time. Two or three different sized feeders should be used. Each group of 100 chicks need the following space according to age: to 4 weeks of age, one 4-foot hopper or the equivalent; from 4 to 8 weeks of age, two 4-foot feeders or the equivalent; from 8 weeks to market age, four 4-foot feeders or the equivalent.

Watering the broilers

Clean, fresh water is extremely important in growing broilers. Chicks are not likely to hunt for it and may die of dehydration. For the first two weeks, small waterers should be used. Most growers use 1-gallon waterers and allow one for each 100 chicks. After the two-week period larger fountains may be used, but most broiler growers switch to automatic waterers. Many different types of automatic waterers are on the market, including the cup type, continuous flow, float systems, angle-iron (either the continuous flow or float), and the double-acting valve.

One should never add medication of any kind to the water until a diagnosis of disease has been made by a competent person. Many broiler houses are equipped with a system for using medication with automatic fountains.

Floor space

Each broiler needs about 1 square foot of floor space. Some growers start two or even three birds to each square foot and then remove one-half or two-thirds of the flock at 5 or 6 weeks of age. With heating systems on the bottom floor of a multiple-story house, some growers start three chicks to the square foot and when the chicks are 6 weeks of age move two-thirds of the birds to the floors above, allowing each bird 1 square foot of floor space.

Broilers kept beyond 12 weeks of age need more space than 1 square foot.

Litter

A good litter must (1) wear well, (2) take on moisture, (3) give off moisture, (4) not be too expensive, and (5) must be free of dust and molds. Many different types of litter fulfill at least some of these requirements. Some are: chopped straw, ground corncobs, sawdust, shavings, peat moss, sugar cane and peanut hulls.

Generally speaking, the more litter one uses, the more absorbing surface there is available to take on moisture. Unless there is floor heat, it is possible to use as much as 6 to 8 inches of litter. With floor heat very little litter can be used because one does not want to insulate the floor pipe and thus lose the efficiency of the heating system. It is important to keep the litter stirred so it will not become packed at any time. During wet or extremely cold weather, it is difficult to keep the litter dry in some houses. Only under extreme conditions should litter be changed during the growing period.

Lights

Most broiler growers use a 10- to 15-watt bulb for each 200 square feet of floor area to keep the birds from crowding at night. During the warm months of summer, it is possible to get better growth by using lights at night. A 40-watt bulb for each 200 square feet of floor area provides enough light so the birds can eat at night when it is cool. Some broiler growers use intermittent light throughout the night. By using a time clock, they have the lights on for one hour and off for three. This gives the broilers a chance to rest and to digest the food between feedings.

Roosts

No roosts are needed for broilers since they are sold shortly after the time they will normally roost.

Cleaning the broiler house

Most broiler growers let their houses stand idle for a short time between flocks. One week is long enough as far as disease is concerned if a good disinfectant is used after cleaning.

The pens should be cleaned thoroughly. If a respiratory disease was present before cleaning, the walls should be vacuumed. A good disinfectant should be used, preferably

Kinds of Litter

Litter	Remarks
Chopped straw	Long straw not satisfactory as litter. Finer chopped, the better.
Ground corncobs	Satisfactory if dry and not moldy.
Sawdust	Usually cheap, must be dry; soft wood sawdust preferable.
Shavings	Usually cheap, must be dry and from soft wood.
Peat moss	Expensive in most areas. Difficult to get dry if once wet.
Sugar cane	Very good litter. Higher cost than some other types of litter.
Peanut hulls	Becoming popular because they don't pack down.

one approved by the United States Department of Agriculture. Lye used at the rate of 1 can to 15 gallons of hot water is an excellent disinfectant and is economical. If one uses a disinfectant with a coal-tar base, plenty of time should be allowed for it to dry for it can cause serious injury to baby chicks.

Cannibalism

Cannibalism can be a serious problem. One main cause of cannibalism is over-crowding and, for that reason, it is wise to give the birds plenty of room (1 square foot per bird).

Broiler growers have found that by reducing the window area in their houses they can cut down cannibalism. The darker the houses, the better, but it is important to have enough light so the birds can see to eat. It is important also not to have too many windows on the sides of the house so the sun shines in directly, because it is in those areas that cannibalism is likely to occur. If cannibalism should become a serious problem, an electric debeaker should be used. One-third of the upper beak should be taken off. In most flocks just a few of the birds are the trouble makers and they teach the others to pick. If the operator can spot the trouble makers and take them out sometimes cannibalism will cease.

Range or confinement

Birds on range do not grow so fast as in confinement and, for that reason, most broiler growers do not allow them to run out-of-doors. The important thing with broilers is to get them ready for market as soon as possible so that another group can be started.

Disease

One of the biggest risks in raising broilers is disease. Not only does it cause mortality, but it also ruins feed efficiency. Usually, broilers are grown in heavily populated poultry areas which tend to make the disease problem more serious. Once a contagious disease gets into a concentrated poultry area, it is likely to make its rounds.

At present the respiratory diseases – bronchitis, Newcastle, and "chronic respiratory" disease – are giving broiler growers the most trouble. Pullorum and coccidiosis used to be troublesome, but with the pullorum eradication program that has taken place, and sulfa drugs, organic arsenical products, nitrophenide, and nitrofurazones for coccidiosis, these two diseases are not so serious as formerly.

New York State has five regional poultry-disease laboratories with the following pathologists in charge: Dr. Saul Narotsky at East Aurora; Dr. P. P. Levine at Cornell University, Ithaca; Dr. Walter S. Packer at Oneonta; Dr. C. I. Angstrom at Kingston, and Dr. K. F. Hilbert of Farmingdale, Long Island. Some local veterinarians also do poultry disease work.

Every grower should get acquainted with the pathologist and

BROILER DISEASES*

Disease	Causative organism	Age affects birds	Symptoms	Mortality expected	Prevention	Treatment	Remarks
Bronchitis	Virus	Any age	Sneezing, coughing, gasping	From 0 to 50 per cent; highest mortality in youngest chicks	Keep wild birds out and do not allow visitors	Raise temperature in house to make them comfortable	Only have one age of birds on the farm
Newcastle	Virus	Any age	Sneezing, coughing, gasping; may show nervous symptoms	From 0 to 90 per cent, depending on age when affected	Vaccinate with intranasal vaccine into the nostril or onto the eyeball at day old	None	Some use wing-web vaccination at 3 weeks of age rather than intranasal
"Chronic Respiratory" disease	Pleuropneumonia organism	Any age	Sneezing, coughing, rattling	Usually low, but may be as high as 40 per cent	Keep wild birds out and do not allow visitors	Some antibiotics at rate of 100 grams or more per ton seem to reduce mortality	Some evidence available that egg transmission may occur
Epidemic tremors	Virus	10 days to 3 weeks	Paralysis; body, tail, or head tremors	Usually low	Hatch from breeding stock that have had no contact with the disease	None	Presumed to be egg transmitted

Pullorum	Bacteria	Day-old to 3 weeks	Loss of appetite, ruffled feathers, drowsiness, pasting	From 5 to 90 per cent	Buy chicks from pullorum-clean or pullorum-passed flock	Some sulfonamids reduce mortality. Disease may occur again after treatment†	Organism is transmitted through egg
Coccidiosis	Protozoa	From 1 week on	Droopy wings, drowsiness; ruffled feathers; bloody droppings may or may not be present	Variable	Good management; do not over crowd; use deep, dry litter	Medication in feed or drinking water†; clean up premises	Intestinal type most difficult to detect
Blackhead	Protozoa	From 8 to 12 weeks most common	Lack of vigor, drowsiness, loss in weight, ruffled feathers, droopy wings	Variable, usually low	Good management; do not overcrowd; use good sanitation measures	Medication in feed or water†	Usually occurs when birds' resistance is lowered and when overcrowded
Aspergillosis	Mold	Any age	Sleepiness, dumpiness, rapid breathing, droopy wings	Usually low	Use only clean, dry litter (not musty); keep litter dry	Remove musty litter and replace with clean	Do not give the birds moldy feed

*Reviewed by Dr. P. P. Levine, New York State Veterinary College, Cornell University.
†Contact pathologist for exact control measure.

veterinarian in his territory, and in case of a disease consult him immediately.

With any disease it is important to keep the broilers eating and to raise the temperature of the house to the point where the broilers are comfortable and do not crowd. Visitors should not enter the pens.

The following chart briefly summarizes the important broiler diseases. It is by no means complete. For an accurate diagnosis, one should always consult the pathologist. On many occasions it is impossible to tell what the disease is without isolating the organism.

Hormonized Broilers

HORMONIZING broilers has been popular for the past few years. The birds are hormonized at about 9 weeks of age and are sold from 3 to 5 weeks later, depending on the weight desired. On most markets the hormonized birds, both light and heavy, are called *hormonized fryers*. They bring a premium of 2 to 10 cents per pound.

A synthetic female hormone (diethylstilbestrol) is used for hormonizing. It is the only female hormone approved by the Food and Drug Administration. With young birds, both the males and females are given the hormone. It is administered in the form of a pill or paste in the neck of the chicken near the skull. The hormone causes more fat to be put on the carcass and also increases maturity and finish. The pills and paste are sold under several trade names.

Marketing

GROWING broilers is only half of the job. Marketing is the other half. If one does a poor job of marketing, he is going to have trouble staying in business regardless of how well he grows the broilers. The grower who does a good job of marketing is the most successful.

The live market

In upstate New York comparatively few broilers are sold alive on the various city markets. Each year the number is fewer. In New York City, however, selling broilers alive is still popular. All of the live chickens that go into New York City must go through the Long Island City Live Poultry Terminal. The demand in this big city is for a barred-feathered bird with a yellow skin. In 1949 and 1950, 70 per cent of the broilers that moved through the Long Island City Terminal were the Barred Cross and 25 per cent were straight Barred Rocks. The Barred Crosses are sold at about 3 to 3½ pounds and the Barred Rocks at 4 to 5 pounds. Even though the demand for live broilers in New York City is dwindling each year, there will probably be a good market for several years. Well over 50 per cent of the live broilers that move into New York City are hormonized.

Selling to dealers and dressing plants

Many poultry dealers in New York State buy broilers at the farm. They will take part or all of the

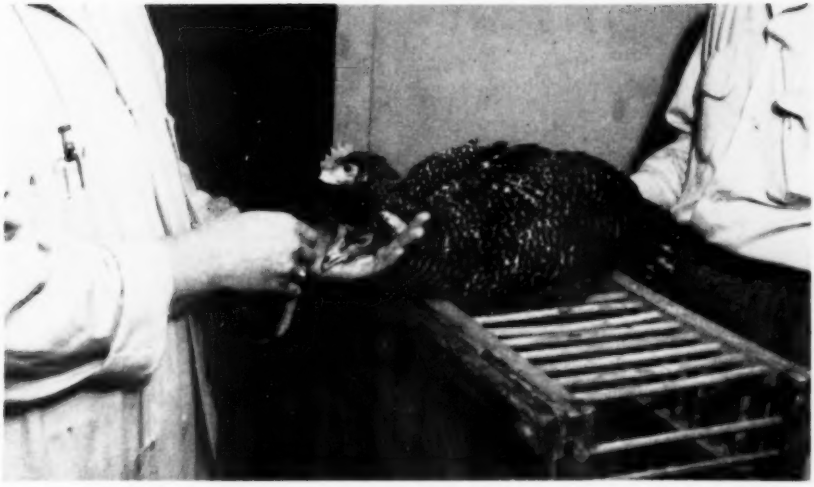
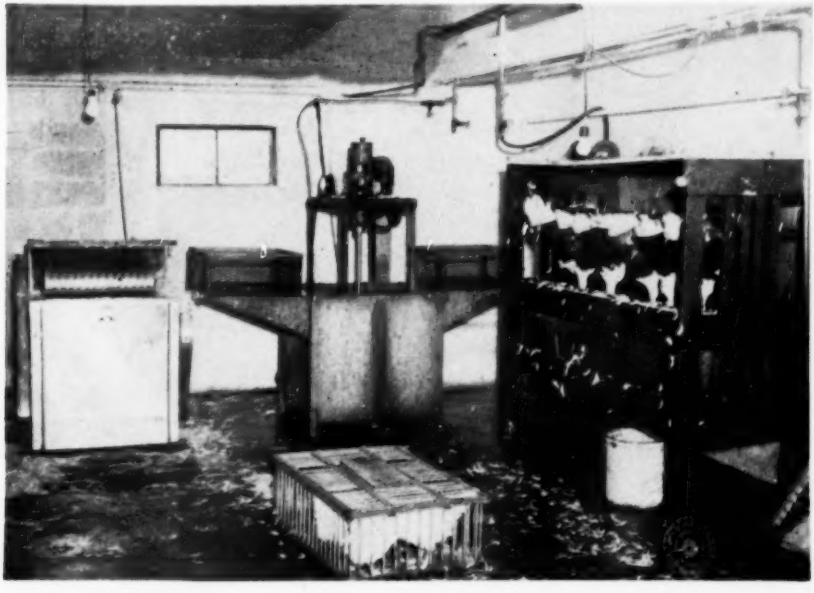


Figure 15. Many broiler growers now use the female hormone in paste form and inject it with an automatic gun-like device. Two broilers are held at once to save time. If a pill is used for hormonizing, it must be injected under the skin of the neck near the skull.

Figure 16. A killing and dressing room on a broiler farm in New York State. Bleeding cones are on the right, automatic scalder in the center, and picker on the left. The cooling vats and eviscerating table do not show.



flock at a certain price. Most poultry dealers resell the broilers to wholesalers or dressing-plant operators. A few retail on the various public markets. It is important to deal only with a reliable buyer.

In the past year or two a few sizeable dressing plants have created a new outlet for broilers. Some of these are financing poultrymen, but most buy on the open market.

Auctions

There are several small poultry auctions in the State. Recently two large ones opened — one at Bath and the other at West Winfield. Throughout the country the auction method of selling live broilers is popular.

Dressing the broilers

Today the consumer prefers to buy broilers ready-to-cook; that is, ready to broil or fry. Small birds are usually split and used for broiling, while the large ones are cut for frying. Most persons purchase by eye appeal; therefore, to build a sound, lasting broiler business, the grower must supply a quality product that is as attractive as, if not more appealing than, other meats. Packaging adds greatly to the attractiveness of broilers, and most growers who sell ready-to-cook broilers have found packaging a good investment.

Selling broilers ready-to-cook has been profitable for many New York poultrymen. Some dress and sell carcasses wholesale, while others retail at the farm or go from house to house. These growers have a small dressing plant on the farm.

A new grading program for ready-to-cook poultry is going into operation in this State. It is known as the *Empire State Trademark Program*. It was originated to benefit dressing plants not large enough to afford federal inspection. Only top-quality ready-to-cook carcasses are allowed to bear the trademark which is a blue label. With this grading, growers will be able to sell to buyers who prefer only to purchase graded carcasses. To obtain information on the Empire State Trademark Program, one should write to the Bureau of Markets, State Office Building, Albany, New York.

A Final Word

THE broiler business is new, and changes are being made so rapidly that it is difficult to keep up-to-date. A certain strain or cross of broilers which is outstanding today may be out-dated tomorrow. To stay in the broiler business, one must keep pace with the new industry.

The capable, conscientious, willing-to-work and willing-to-learn person should find broiler raising a fairly profitable and pleasant business. Although a relatively new business, broiler growing is already competitive and there are plenty of problems.